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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,304	12/12/2003	Hiroyuki Urakami	041514-5318	7325

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EXAMINER

SHERMAN, STEPHEN G

ART UNIT	PAPER NUMBER
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2629

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/733,304

Applicant(s)

URAKAMI ET AL.

Examiner

Stephen G. Sherman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-6 is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the amendment filed 31 January 2008.

Claims 1-6 are pending.

Response to Arguments

2. Applicant's arguments filed 31 January 2008 have been fully considered but they are not persuasive.

On page 5 of the response the applicant argues the newly amended claims as not being taught by the combination of Honda and Suzuki. The applicant argues that the subfield arrangement done by Honda is a line-by line adjustment, which is one dimensional, and that the newly-amended claim 1 adjusts the subfields on a field-by-field basis, which is two-dimensional. The applicant's then state that if Honda were modified with Suzuki, that the multi-grayscale processing circuit must perform one-dimensional error diffusion because Honda must deal with one-dimensional subfield adjustment (and in turn one-dimensional brightness adjustment). The examiner respectfully disagrees.

First of all, the examiner will assume that the error diffusion and dither processing taught by Suzuki is "two-dimensional" since it is performed on the image signal, and that there is no special error or dither processing being done since the present specification does not say anything about "two-dimensional" error or dither processing, and if the

applicant has meant anything more than this, then this would raise enablement issues.

Thus, Suzuki teaches two-dimensional error and dither processing.

Secondly, the applicant's state that the newly amended claim 1 adjusts the subfields on a field-by-field basis, however, this limitation is not found anywhere in the claims. The claims never state "field-by-field". Further, it appears that the applicant has intended field-by-field to mean "pixel-by-pixel", which is not in the claim. The claim merely states "a brightness frequency data circuit...for each field of the image signal" and "a controller for adjusting, for at least two brightness regions for each field of the image signal, the number of subfields at each brightness..." As explained in the rejection Figure 4 and paragraphs [0047]-[0048] explain that the accumulated frequency data is used in each display line of one field, meaning that the subfield pattern is changed every line in each field. Thus, the subfield patterns will still be changed every field, i.e. field-by-field. As opposed to what the applicant thinks, field-by-field does not have anything to do with the subfield arrangements being done "two-dimensionally". If the applicant wants the subfield adjustment to be done two-dimensionally then the limitation should be added to the claim. The applicant is reminded that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993):

Third, even if the claims stated that the subfield adjustment was two-dimensional, i.e. pixel-by-pixel, the combination of references would still teach "two-dimensional" error diffusion and dither processing because the subfield adjustment and multi-

grayscale processing are not related in the claims. The image signal can still have error and dither processing done "two-dimensionally" and the subfields can then still be adjusted line-by-line every field because the two processes are NOT related to each other. Once the gray-scale processing is done, then the brightness frequency can be measured and the subfields adjusted. Therefore, the combination of references does not mean that one-dimensional error diffusion must take place.

Fourth, the subfield adjustment made by Honda is two-dimensional. In the applicant's invention, the brightness frequency data is accumulated for one field and then the subfields are adjusted for different brightness regions, for example 0-128 and 129-255. In Honda, instead of accumulating the brightness frequency for every line of the display at once, the brightness frequency is accumulated one line at a time. This means that at a first line, the image data is analyzed and the different regions are found and the subfields adjusted in the horizontal direction, then the next line is done, which is a vertical direction, until all in a field are done. This means that the adjustment is done two-dimensionally in a field.

Therefore, the references still teach the claimed invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honda et al. (US 2002/0030672) in view of Suzuki et al. (US 6,476,781).

Regarding claims 1, Honda et al. disclose a display device including a display panel (Figure 1), wherein each field of an image signal is divided into a plurality of subfields (Figure 24(a)), the display panel includes a plurality of pixel cells for each pixel, and gray scale display is performed by based on the selectively causing emission in the pixel cells image signal for each of the subfields (Paragraph [0031]-[0032] explain that pixel cells are provided. Figure 3 and paragraph [0036] explain about all of the possible luminance values and paragraph [0048] explains how the luminance values are associated with subfields.), the display device comprising:

a brightness frequency data circuit for generating frequency data indicating a number of pixels at each of the same brightnesses distribution for each field of the image signal (Figures 1 and 2 and paragraphs [0036]-[0040] and [0042]-[0045] explain

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that according to pixel data, the 1H line luminance distribution analyzing circuit 3 creates accumulated frequency data and a luminance distribution.); and,

a controller for adjusting, for each of at least two brightness regions for each field of the image signal, the number of subfields at each brightness within each brightness region, based on the frequency data of the pixels concerned (Figure 4 and paragraphs [0047]-[0048] explain that the drive control circuit 2 sets a driving sequence based on the accumulated frequency data, and that the number of subfields used depends on the patterns shown in Figure 4, where 10 subfields are used if full luminance is needed as shown in the region of pattern A, and 5 subfields are used for patterns B, C and D where the brightness regions are between 0 and 128, 64 and 192, and 128 and 255 respectively, where this subfield determination is done every field of the image signal, which is explained in the first sentence of paragraph [0047] which states "...fetches the accumulated frequency data AC in each display line of one field". This means that every though the pattern is changed every line, the number of subfields is still changed for each field.).

Honda et al. fail to teach the display device comprising a multi-grayscale processing circuit for two-dimensional error diffusion processing or two-dimensional dither processing on the image signal.

Suzuki et al. disclose a display device comprising a multi-grayscale processing circuit for two-dimensional error diffusion processing or two-dimensional dither processing on the image signal (Column 4, lines 18-39).

Therefore, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to incorporate the multi-grayscale processing circuit for error diffusion processing as taught by Suzuki et al. in the display device taught by Honda et al. in order to determine multi-level gray scale pixel data that is provided with the number of the bits thereof reduced to 4 bits while maintaining the number of visual brightness levels of halftone to approximates 256 levels of halftone.

Regarding claim 2, Honda et al. and Suzuki et al. disclose the display device according to Claim 1.

Honda et al. also disclose wherein the controller increases the number of the subfields used for the brightness region when a number indicated by the brightness frequency data is larger than a predetermined value (Figure 4 shows that when the frequency data indicates that the brightnesses needed exceed the thresholds of the limitations set by patterns B, C and D, that pattern A is used, which requires more subfields than the other patterns as explained by paragraph [0048].).

Regarding claim 3, Honda et al. and Suzuki et al. disclose the display device according to Claim 1.

Honda et al. also disclose wherein the greater a number of the subfields used for the brightness region, the more the controller shortens a period of emission of the pixel cells performed in each subfield (Figure 24 shows that when only 5 subfields are used

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as shown in (b) the period for emission is longer for SF5 than in the period for emission for SF5 as shown in (a) where there are 10 subfields.).

Allowable Subject Matter

6. Claims 4-6 are allowed.

7. The following is an examiner's statement of reasons for allowance:

The primary reason for allowance is the recitation of the "brightness frequency data circuit," "logarithmic conversion circuit," "clipping circuit," "cumulative brightness frequency data circuit," and the "delimiter value generation circuit" all working in conjunction with each other to produce the values which allow for the driving of the pixels, the structure not found singularly or in combination in the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

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8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS

21 February 2008

AMR A. AWAD
SUPERVISORY PATENT EXAMINER
